

Report on the EOSC Winter School

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Thessaloniki, Greece: EOSC Winter School 2024

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Terminology	
Terminology/Acronym	Definition
DG RTD	European Commission Directorate-General for Research & Innovation
EC	European Commission
EOSC	European Open Science Cloud
EOSC-A	European Open Science Cloud Association
EOSC Partnership	The European Commission's Co-Programmed European Partnership for EOSC
FAIR	Findable, Accessible, Interoperable, Reusable (data)
HE	Horizon Europe
HE EOSC-related projects	Horizon Europe INFRAEOSC and related projects supporting EOSC
INFRAEOSC projects	Destination INFRAEOSC projects within the EU's research and innovation funding programme
MAR	EOSC Partnership Multi-Annual Roadmap
Macro-Roadmap	The Macro-Roadmap for the implementation of EOSC - a visual mapping of the results of EU projects developing EOSC and the in-kind contributions of EOSC Association member organisations.
OA	Opportunity Area
REA	European Research Executive Agency
SRIA	EOSC Partnership Strategic Research and Innovation Agenda
SRIA Action Areas	SRIA 1.1. Action Areas: Implementation challenges and Boundary Conditions
TF	EOSC-A Task Force

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Executive summary

The present document reports the first EOSC Winter School, organised in Thessaloniki (Greece) in early 2024 by the EOSC Association with the support of the EOSC Focus project, the Horizon Europe (HE) EOSC-related projects, and local organisers from the RAISE project consortium.

The Winter School had the goal of increasing collaborations among the EOSC-related projects funded by the Horizon Europe programme of the European Commission, identified as essential to enable faster progress towards creating EOSC, the “web of FAIR data and services” envisioned to implement Open Science in Europe co-developed by the European Commission and the EOSC Association under the EOSC Co-programmed European Partnership. Collaborations between projects should aim to generating results that contribute to a better return on investment from the projects by delivering “one EOSC” that is more than the sum of the results of the individual projects. Additional input in the discussions and meetings at the Winter School was provided by the results obtained by the Task Forces set up by the EOSC Association.

Participants included representatives of all EOSC-related projects, co-chairs of the EOSC Association Task Forces, representatives of the European Commission, and facilitators from EOSC Focus and EOSC Association’s Board of Directors. The meetings were organised in seven “tracks” or “Opportunity Areas for technical collaboration”, or Opportunity Area groups, which are a translation of the high-level Action Areas of EOSC’s Strategic Research and Innovation Agenda into specific technological challenges. Attendees were split into the tracks according to their interests and expertise to devise collectively actionable and collaborative work plans.

Originally identified by the Horizon Europe Technology Working Group established by EOSC Focus under the Vademecum to increase mutual knowledge among EOSC-related projects, the Opportunity Areas describe topics addressed by the EOSC-related projects with good chances of enticing several of them into a collaboration.

The focus of the report is placed on the actions designed by the different discussion groups (Chapter 2), envisioned to become the “tangible” result of the Winter School after they are translated into a work plan during the spring of 2024. A description of the origin and preparation of the EOSC Winter School, as well as extensive summaries of the conclusions and recommendations reached in all the Opportunity Areas, is provided as background material.

The scope and detail of the actions suggested, however, present important variations between Opportunity Area groups. This suggests that further work within the Horizon Europe Technology Working Group is needed to identify topics where concrete collaboration opportunities can be established, and to develop them into a realistic work plan.

Pending on the realisation of the objectives of the actions, the Winter School has proved to be the right setting to create down-to-earth operational plans to realise the SRIA in a collaborative spirit. A second edition that incorporates the lessons learnt into an updated methodology and scope is planned for early 2025, still under the coordination of EOSC Focus as main support for EOSC Association to engage with EOSC-related projects.

1. Introduction

The 2024 EOSC Winter School, held between 29 January and 1 February 2024 in Thessaloniki, Greece, was a three-day meeting of all Horizon Europe projects involved in the development of tools and services for EOSC, Europe's approach to implement Open Science through a "web of FAIR data and services" initiated by the European Commission (EC). The EOSC Winter School was conceptualised following a suggestion at the EC's 2023 yearly June coordination meeting with INFRAEOSC projects².

The school was organised by the EOSC Association (EOSC-A), supported by the EOSC Focus project³, the HE EOSC-related projects, and local organisers from the RAISE project consortium, to provide an environment where well-defined technical topics could be discussed in detail, with the prospect of establishing collaborations among projects that can accelerate progress towards creating "one EOSC". Additionally, the Winter School (WS) aimed at integrating the outputs of the EOSC-A Task Forces⁴ into current or future Horizon Europe EOSC-related projects.

The WS is inscribed under the activities of the Horizon Europe Technology Working Group (HE Technology WG), itself a result of the collaboration framework among projects from the Destination INFRAEOSC in the EC's funding programme⁵ facilitated by EOSC Focus. A key element for the success of the school was that the topics discussed were decided by the technical coordinators of the projects and Task Force co-chairs, thus ensuring that they concerned the technical challenges faced by EOSC that are currently addressed by the projects. The main result of the WS is the translation of these so-called "Opportunity Areas for technical collaboration" identified by the consortia working on EOSC into concrete actions to be implemented by the projects in a collaborative spirit. The positive experience of this first WS is expected to be repeated in future editions.

This report is organised as follows: The main ingredient of the report, namely the results of the discussions in the seven "tracks" of the Opportunity Areas for technical collaboration, is included in chapter 2. In chapter 3 we describe briefly first the planning of the school, followed by the objectives and the activities organised to accomplish them. Chapter 4 provides an overview of the programme, with full details available in the Appendix. A summary of the opening plenary session that set the scene is presented in chapter 3. Chapters 5 and 6 contain the main findings and road ahead.

2. <https://bit.ly/2023-EOSC-projects-coord-meeting>

3. <https://eosc.eu/eosc-focus-project/>

4. <https://eosc.eu/eosc-task-forces>

5. For an overview of all projects and open calls of the Destination INFRAEOSC, "Enabling an operational, open and fair EOSC ecosystem (INFRAEOSC)", please visit <https://bit.ly/DestinationINFRAEOSC>.

2. Opportunity Areas for technical collaboration

Definition and action list from the EOSC WS

The meetings and discussions at the WS were organised into seven parallel “tracks”, each one dedicated to a specific topic related to the technical aspects of the development of EOSC. A detailed account of how the “Opportunity Areas for technical collaboration”, or OAs for short, are defined, and how they were selected, can be found later in this report under Chapter 4.

OA name	Leading INFRAEOSC project(s)	Related EOSC-A TF(s)
OA1: PIDs	FAIRCORE4EOSC, FAIR-Impact, RAISE	PID Policy and Implementation
OA2: Metadata, Ontologies & Interoperability	FAIRCORE4EOSC, FAIR-Impact	Semantic Interoperability
OA3: FAIR Assessment & Alignment	FAIR-Impact	Long-Term Data Preservation, FAIR
OA4: User & Resource Environments	EuroScienceGateway, AqualNFRA	Technical Interoperability
OA5: Skills, Training, Rewards, Recognition &	Skills4EOSC, EOSC4Cancer, EuroScienceGateway	Upscaling Countries; Data Stewardship; Researcher Engagement & Adoption
OA6: Open Scholarly Communication	Skills4EOSC, CRAFT-OA, SciLake	Upskilling countries
INFRAEOSC Projects: Sustainable pathways to impact	EOSC-A, EOSC Focus*	Financial Sustainability

Table 1: Opportunity Areas for technical collaboration

* As this is a cross-cutting topic relevant for all projects, this was led by EOSC-A

2.1 Identified actions, activities, and timeline

The OA groups were free to choose the format for their sessions and the activities to steer the discussions. They were provided by the organisers with templates for reporting and documenting, to help summarise the result of discussions homogeneously. The OA groups were asked to identify concrete actions for which collaboration between two or more INFRAEOSC projects is needed, and to indicate further the time scale by when the actions should be completed (short term (<6 months))

The time scales are to be understood as follows:

- Short-term: to be accomplished in less than 6 months from WS, i.e. around summer 2024
- Medium-term: to be accomplished in between 6 and 18 months from WS, i.e. around summer 2025
- Long-term: to be accomplished beyond summer 2025

OA1: PIDs				
Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Re-establishment of TF PID or similar mechanism	Must be led by EOOSC-A	Current TF members and others interested as required	TF expected to take ownership of policy updates and serve as interim mandated authority for assessing EOOSC PID compliance	Short-term
Specification of requirements for new projects regarding PIDs and compliance with PID Policy [Rationale: New projects should use/extend existing PID services, or else indicate why new ones must be developed]	Lead	EOOSC-A, EC (otherwise not possible to get topics into WP)	Create working document(s) to specify requirements for new projects about compliance with (EOOSC) PID Policy to be included in next MAR/WP	Medium-term
Support development of federated national and regional SKGs and PID Graphs through contributions to e.g. RDA	Lead	Relevant RDA WGs, others to be specified	To be discussed	Long-term

OA2: Metadata, Ontologies & Interoperability (1/3)				
Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Support hands-on collaborative work across EOOSC projects: Establish effective channels for cross-project collaboration and to explore how different tools and solutions from EOOSC-related projects can be integrated, reused and aligned.	Lead, Initiative by OA2 participants	EOOSC-A TF T&S Interop, TF Health Data, EOOSC Projects	An interest group: Connecting OA2 stakeholders: EOOSC-A provides the means to establish a basic communications channel, e.g. mailing list, EOOSC Forum space, or website. Other solutions would be explored by the group as the needs arise. The group should be open to those who can contribute to solutions with minimal hurdles.	Short-term

OA2: Metadata, Ontologies & Interoperability (2/3)

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Support hands-on collaborative work across EOOSC projects: Establish effective channels for cross-project collaboration and to explore how different tools and solutions from EOOSC-related projects can be integrated, reused and aligned.	Lead, Initiative by OA2	EOOSC-A, EOOSC Projects	Matchmaking for OA2: Opportunities, events and learnings: OA2 will promote relevant opportunities and events, facilitate collaborations across projects, TFs and other stakeholders, and contribute to organising sessions at the EOOSC Symposium and other events to support hands-on collaborative work and showcase learnings and outcomes of collaborations that OA2 members want to share.	Short-term
	Led by OA2	EOOSC-A, EOOSC-related projects	Develop peer-to-peer interactions between EOOSC-related projects	
What could an EOOSC Interoperability Board (EIB) do for the EOOSC projects? Explore the impact that introducing an EOOSC Interoperability Board as proposed by Karl Luyben at EOOSC Winter School 2024 ⁶ would have on the activities of EOOSC-related projects activities and outcomes	Lead, Initiative by OA2	EOOSC-A, TF T&S Interop, TF Health Data, EOOSC Projects	A workshop/webinar: EIB relevance to EOOSC projects: EOOSC-A will present the current state of the EIB to keep OA2 stakeholders informed, and to get early input from EOOSC-related projects. The outcome could be summarised in a short report of the presentation and discussions.	Short-term
	Facilitate, Initiative by OA2	Lead by EOOSC-A or TF T&S Interop, TF Health Data, EOOSC Projects	Consultation: EIB impact on current EOOSC projects: EOOSC-A could call for EOOSC-related projects to respond to a few questions to indicate the potential impact to their activities and how they would like to be consulted going forward.	Short-term
How to align Task Force (TF) learnings and EOOSC-related projects? Ensure that EOOSC projects adopt, apply or implement, to the extent possible, results and recommendations on interoperability delivered by the TFs.	Facilitate, Initiative by EOOSC-A	Lead by EOOSC Focus TF T&S Interop, TF Health Data, EOOSC-A	Adoption of outputs from TFs in EOOSC projects: Alignment between former and new TFs and EOOSC-related projects should be sought by e.g. presentings an overview of recommendations and proposed solutions described in TF outputs related to OA2, to assess what is already being done across projects and what current and future projects should adopt, apply or implement.	Medium-term

OA2: Metadata, Ontologies & Interoperability (3/3)

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
<p>How to align Task Force (TF) learnings and EOSC-related projects? Ensure that EOSC projects adopt, apply or implement, to the extent possible, results and recommendations on interoperability delivered by the TFs.</p>	Lead, Initiative by EOSC-A	TF T&S Interop, TF Health Data, EOSC-A, EOSC Projects	<p>Shared practices: TF-to-project interactions: OA2, with support from EOSC-A, will work with the new TFs and the current EOSC-related projects to suggest a structure for TFs to effectively liaise with EOSC projects on OA2 topics. This would include some form of communication channel to ensure TFs and all of the relevant EOSC projects get feedback on developments and initiate collaborations.</p>	Medium-term
<p>What is the EOSC approach to metadata and ontologies? Establish a shared point of departure and frame of reference for current and future EOSC projects to support productive discussions, effective integrations and sustainable projects results going forward.</p>	Facilitate, Initiative by EOSC-A	Lead by EOSC-A, TF T&S Interop, TF Health Data, EC, EOSC-related projects	<p>Consultation: Input to SRIA 2.0 Conclude the work initiated leading up to and during the SRIA session at the EOSC Winter School to consolidate problems and gaps identified by [former] TF and HE project outputs as input to the development of SRIA 2.0. Also, promote participation and encourage contributions to SRIA 2.0 consultations among OA2 stakeholders.</p>	Medium-term
	Facilitate, Initiative by OA2	Lead by TF T&S Interop, TF Health Data, EOSC-related projects	<p>Shared practices: The EOSC approach to metadata and ontologies: Produce an overview of how EOSC projects approach metadata and ontologies. Propose a minimal approach that current and new projects should adopt as a baseline to improve sustainability of the results.</p>	Long-term
	Facilitate, Initiative by EOSC-A	OStrails	<p>Consultations: Input to calls 2026-27: Contribute to design funding calls to develop rules, specifications, roles, and responsibilities to create SKG & PID Graph federation and maintain it</p>	Long-term

OA3: FAIR Assessment & Alignment

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Start of the new TFs [on FAIR assessment]	Led by EOSC-A	FAIR Mapping RDA WG(accepted); Data Set Quality WG (still in preparation)	Align with different initiatives (GREI, new RDA working groups) & relevant projects (FAIR-IMPACT, OSTrails, EOSC Beyond, AI4EOSC, EVERSE & SIESTA)	Short-term
Development of Commons and Governance for FAIR tests	Co-lead	OSTrails/FAIR IMPACT	Commons and Governance for FAIR tests	Medium-term
Development of operational long term preservation and data quality practices	Contribution	HORIZON-INFRA-2024-EOSC-01-04 / 03	Align recommendation from TF long term preservation and TF branch data quality	Medium-term / Long-term
Develop sustainable funding mechanisms, integrating the Governance Model in repositories and include them in the evaluation of the Governance Model.	Lead	To be discussed	To be discussed	Long-term

OA4: User & Resource Environments (1/2)

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Ensure continuation of ongoing inter-project collaborations: FAIR-EASE + AqualNFRA (replicate infrastructure), RAISE + AI4EOSC + EuroScienceGateway (security, Galaxy), FAIR-EASE + EuroScienceGateway (enhancing technical aspects of the Galaxy Platform)	Coordination, facilitation	Project partners in each case to be specified	Establish coordination/alignment mechanisms with projects and relevant EOSC-A TF	Short-term
Develop examples of and best practices for Quality Research Software	Lead	TF Infrastructures for Quality Research Software ⁷ , EVERSE	Meetings, working documents	Short-term
Increasing user communities e.g. 100,000 users on Galaxy	Lead	Community	To be discussed	Short-term
EGI-checkin integration with Galaxy	Lead	EGI	To be discussed	Short-term
Increase use of AAI features (multi-factor, vetting ...)	Lead	TF (AAI Architecture ⁸)	Federated EOSC Core AAI, EGI Check-in Description of features that could be adopted, and how & for what purposes	Medium-term
Organisation of hackathons and technical meetings	Lead	Galaxy Community EGI Community	Meetings/hackathons will set their goals & mechanisms	Medium-term

7. <https://eosc.eu/advisory-groups/infrastructures-quality-research-software>

8. <https://eosc.eu/advisory-groups/aa-architecture>

OA4: User & Resource Environments (2/2)

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Better integration of data discovery across EOSC projects	Lead	EOSC Beyond	Creation of handbook to integrate DD in projects and align with EOSC-A TF semantic interoperability	Medium-term
Common training framework	Lead	Skills4EOSC	Define characteristics sought for the framework, compare them with GalaxyTrainingNetwork to see if it's suitable. Are there any other options that can be considered?	Medium-term
Guidelines for VRE (e.g., FAIR-EASE will provide best practices)	Lead	FAIR-EASE	Provide feedback on project deliverables and extract common aspects in guidelines	Medium-term
Project starter kit (for follow-up projects, TheNextGeneration)	Lead	To be discussed	e.g., best practices from different projects consolidated in one document	Long-term
Explore evolution of VREs to trusted VREs	Lead	ENTRUST, OSCARS	To be discussed	Long-term
Hardware resources and their sustainability	Lead	EOSC Procurement	Scope of necessary hardware for VREs	Long-term
Sustainability of VREs and TREs	Lead	Sustainability Expert Group (HE EOSC Impact Group)	Description of VRE/TRE requirements that may lead to quantitative estimation of necessary funds. Also, valid business models for VRE operators.	Long-term

OA5: Skills, Training, Rewards, Recognition & Upscaling (1/3)

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Theme Training material, Learning Paths, Curriculum Define approaches to harmonise existing learning paths and methodologies	Facilitate discussion	Training community, Skills4EOSC Competence Centre Network	Mapping workshop, Collect information about existing methodologies (e.g. Skills4EOSC's MVS and FAIR by Design Methodology, ELIXIR Learning Paths); analysis and formulation of next steps	Short-term

OA5: Skills, Training, Rewards, Recognition & Upscaling (2/3)

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Theme Training material, Learning Paths, Curriculum Training metadata -> Get commitment from the EOSC actors involved in training to adopt the RDA minimal metadata standards	Advice role; Sharing best practices and approach	Training community, Skills4EOSC Competence Centre Network, RDA Education and Training on Handling of Research Data IG, EOSC onboarding team	Starting from existing resources (e.g. <i>RDA recommendation for minimum set of metadata</i> ¹⁰ , Skills4EOSC's FAIR by Design Methodology, and <i>Community-endorsed quality assurance and certification framework for professional training and qualifications</i> ¹¹), facilitate discussion towards a common agreement between EOSC actors.	Long-term
Theme Training material, Learning Paths, Curriculum Support the development of a harmonised & certified data steward curriculum in Europe	Advice role.	Led by Skills4EOSC. Training community, relevant RDA WGs and IGs (e.g. Professionalising Data Stewardship IG)	Ensure alignment with f curriculum efforts in the Skills4EOSC curriculum work ¹² - an alignment workshop?	Short/ Medium-term
Theme Training material, Learning Paths, Curriculum Work towards embedding a harmonized & certified curriculum for data stewardship in Europe (MAR 2025-2027)	Advice role. Consortium building	Training community, Skills4EOSC Competence Centre Network, relevant RDA WGs and IGs (e.g. Professionalising Data Stewardship IG)	Work towards sustainability/ embedding of the curriculum for after the end of Skills4EOSC OA5 could put a consortium in place to respond to the call	Long-term
Theme Training Catalogue/Training Infrastructure Become involved in the handover of EOSC Future Knowledge Hub to the developers of the new portal in EU Node	Lead	EOSC Future, EOSC EU Node consortia, DG CNECT	Liaise with EOSC Future and developers of new portal; Ensure all requirements for the Training/Skills part of the portal are taken into account.	Short-term
Theme Training Catalogue/Training Infrastructure Explore/define/implement Training as a Service in EOSC using Galaxy Training Network (GTN) as a use case	Advice role	GTN (Lead), EOSC Eu Node	Onboard Galaxy Training Network (GTN) in the EOSC EU Node Collaborate with GTN to secure EOSC Track in the GTN annual global online training event 2025 Smorgasbord	Medium / Long-term
Theme Competence Centres Contribute to Skills4EOSC Competence Centre Network Launch event, June 25th, 2024	Participate	Skills4EOSC (lead)	Alignment, increase visibility, work towards sustainability model of Competence Centres	Short-term
Theme Competence Centres Explore organisation of a workshop on Competence Centres at EOSC Symposium 2024	Co-lead	Skills4EOSC, OSCARS, EVERSE, EuroScienceGateway, EOSC Focus EOSC Symposium organisers	Requires alignment with OSCARS and Skills4EOSC	Short-term (completed)

10. <https://archive.rd-alliance.org/group/education-and-training-handling-research-data-ig/outcomes/recommendations-minimal-metadata-set>

11. *D2.3 Community-endorsed quality assurance and certification framework for professional training and qualifications*, <https://zenodo.org/records/8305482>.

12. See e.g. *Recommendations for Data Stewardship Skills, Training and Curricula with Implementation Examples from European Countries and Universities*, <https://zenodo.org/doi/10.5281/zenodo.10573891>

OA5: Skills, Training, Rewards, Recognition & Upscaling (3/3)

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Theme Competence Centres Increase awareness about and visibility of Competence Centres at National Tripartite Events	Ambassador	Skills4EOOSC, EOOSC-A (as co-organiser of NTEs)	OA5 group, as expert representatives for skills/ training in their country & organisations could be excellent ambassadors to make sure the competence centre concept is presented during national tripartite events when appropriate	Medium / Long Term
Theme Engagement Working with EOOSC Focus to support engagement activities	Connector/ Contributor	EOOSC Focus, Skills4EOOSC	The OA5 group comprises many experts who are key EOOSC advocates in their counties and scientific domain. Their expertise can provide 'bottom-up' support for EOOSC Tripartite activities, enabling fuller engagement and upscaling at national level.	Short/Med/ Long-term
Theme Accreditation, Recognition, and Assessment Support the EOOSC Association and relevant EOOSC projects to reach CoARA objectives	Advice role	EOOSC Association, CoARA, GraspOS, OPUS, OSTrails	A joint meeting between the EOOSC Association and CoARA took place on 11 April 2024	Long-term
Theme Accreditation/Recognition/ Assessment Further discussion on aligning training certification / accreditation	Facilitate discussion; Enable alignment.	Skills4EOOSC, EVERSE, Training communities	Starting from existing resources (e.g. Skills4EOOSC FAIR by Design Methodology, Community-endorsed quality assurance and certification framework for professional training and qualifications, and Skills4EOOSC Recognition Framework ¹³ , ELIXIR Certification Working Group, and GTN recognition framework) the OA5 group could create mappings and synergies with other projects and initiatives.	Long-term
Theme EOOSC Skills & Training Strategy Develop a mechanism to provide strategic oversight, coordination and governance of EOOSC Training elements	Contribute	Skills4EOOSC, EOOSC-A	Work with EOOSC Association to decide appropriate governance mechanism eg Advisory Group. Ensure training is part of any Nodes discussion	Medium-term
Theme EOOSC Skills & Training Strategy Ensure long-term sustainability of developed EOOSC related training resources	Contribute	Skills4EOOSC, EOOSC-A	Support Skills4EOOSC Competence Centre Network and Nodes to ensure clear ownership and responsibility for maintenance, implementation and sustainability of training activities.	Medium-term

13. <https://www.skills4eosc.eu/resources/deliverables-milestones>

OA6: Open Scholarly Communication

Action	Role of OA	Others involved (required/desired)	Activities + outcome	Timescale
Support the proposal of a TF or WG on Open Scholarly Communication [or equivalent body]	Decision to be made by EOSC-A	People in the EOSC community interested in OSC topics	Contribute to set the name, tagline and presentation, and raise awareness about the importance of OSC for the EOSC community.	Short-term
Role of machine actionability of digital objects in OSC	Lead	OpenAIRE, OPERAS, CRAFT-OA, DIAMAS, OSTrails?	Work on concrete actions that require a collective approach (i.e. cannot be tackled by a single project) to further define and understand: <ul style="list-style-type: none"> • Role of machine actionability of Digital Objects in OSC; • How can data peer review and quality assessment be improved?; • Diversity of OSC "outputs" and improve how they are treated as "publications" • AI opportunities and risks; • EOSC support to Diamond OA 	Medium-term
Explore AI opportunities and risks for OSC	Lead	AI4EOSC?	Questions to look into: <ul style="list-style-type: none"> • Is the community ready to introduce AI techniques, what are the challenges with the current research outputs? • Can anyone in the EOSC community build on top of existing corpora, or be used for training any potential models? 	Medium-term
EOSC support to Diamond OA	Lead	EOSC-A and Others (e.g. EOSC nodes/managers, etc)		Long-term



Figure 1: Pictures of the seven sessions (starting with OA1 top left), including six OAs and the Impact track



3. Summaries from discussions by the OA groups

3.1 / OA1: Persistent Identifiers (PIDs)

Tuesday afternoon:

- Review of the Demand & Supply in PID Landscape: Workflows and Use Cases & PID Systems and Services
- Overview of Task Force PID Policy
- Emerging PID (RAI, RAiD, PIDInst, MA DMPs, SWHID) & PID integration systems (PID Graph, PID Meta Resolver)

Discussion highlights:

- Connection and exchange between TF and projects already ongoing!
- Gaps and challenges of established and emerging PID Systems

Wednesday morning:

- The EOSC PID Policy and its Implementation in the Compliance Assessment Toolkit (CAT)
- Review of Mechanisms for Quality Assurance - including EOSC PID Policy and Best Practices

Discussion highlights:

- Emphasis on community engagement in respect of criteria (applicability) and best practices
- Suggestions were made for improvements to and extensions of the CAT (EOSC PID Policy Compliance Assessment Toolkit)
- Consensus in the group on interpretation of the policy, actors' roles and responsibilities.

Wednesday afternoon:

- Case study - evaluating the RAI ID (developed by RAISE) against the EOSC PID Policy
- Validation of the policy with respect to intrinsic PIDs (aimed at authenticity and integrity)

Discussion highlights:

- Holistic alignment on EOSC PID policy update and implementation (from governance, grant proposal to assessment)
- Differences between maintenance of well established PID infrastructures vs emerging PIDs
- Differences/tensions between OPEN and FAIR

Recommendations

- Certification Authority for PID CAT: need for a mandate/authority to take over the certification
- Require PID Policy reference for new projects implementing new PIDs: If new PIDs are planned in project proposals, there should be a reference to PID policy
- Transition period to new EOSC-A designated authority group: formalisation of commitments and responsibilities
- Encourage adoption of community governed sustainable PID infrastructures: Fund and enforce adoption of existing PID systems that are aligned with the EOSC PID policy
- Shifting from creating PID systems to those services built on top of them
- Explore the federation of research graphs, and querying over federated graphs: defining value through use cases (exploiting the potential of PID graphs)

3.2 / OA2: Metadata, Ontologies & Interoperability

Tuesday afternoon:

- **Opportunity Area Matrix:** SRIA-challenges covered/not-covered by EOSC-related project activities and examples of solutions.
- **Task Force Results:** Reference architecture, interoperability profiles, maturity for semantic artefact catalogues, mappings and crosswalks, shared/common use cases.
- **SRIA 2.0 and future Task Forces:** Task force deliverables and associated recommendations can serve as a conversation starter.

Overall, the discussion related to the SRIA has shown that the topic of metadata and ontologies is only superficially present in INFRAEOSC projects, except for FAIR-IMPACT and FAIRCORE4EOSC, that were explicitly called to advance this domain. Each project declared activities in OA2 work (FAIRCORE4EOSC, FAIR-IMPACT, EuroScienceGateway, BY-COVID, WorldFAIR, Blue-Cloud2026, FAIR-EASE) and contribute to the field, although not necessarily following a coordinated approach. The group agreed on the importance of having an overarching EU project in the EOSC landscape that will tackle the metadata, ontologies and semantics aspects to help EOSC progress at the core level.

Wednesday morning:

- **Topic proposals for the hands-on session:** 14 topics covering mappings, vocabularies, representation of variables, metadata, data integration, provenance, services.
- **Cross-Domain Interoperability:** Cross-domain Interoperability Framework (CDIF), focus on tasks/ use cases such as data integration.
- **Domain and upper ontologies:** Linking general and more specific conceptual models and common data elements, examples from earth observations and rare diseases.

Wednesday afternoon:

- **Web of FAIR services (and data):** Scenarios around service discovery and composition and examples of how to describe them, FAIR signposting, DCAT-AP.
- **Tools for mappings & crosswalks:** User interfaces and “smart” solutions to generate and execute data transformation from one format to another.
- **Enabling future collaboration:** Fora for “groups” such as EOSC-A, RDA, incentives, resources and coordination.

Recommendations

- Collaboration between projects and TFs would be appreciated, people want to engage.
- Establish a process to support the collaboration between TF and Projects, maybe via EOSC Forum, but further discussions are needed to assess the platform’s capacity to do that.
- Align TF outcomes and EOSC projects: *How to align TF learnings and EOSC projects?*

3.3 / OA3: FAIR Assessment & Alignment

Tuesday afternoon:

Discussion highlights:

“Data quality” was the main discussion topic of this session: how to establish priorities between its many different areas. The difficulty here is that there are large differences depending on the domain, and also on whether there are already any standards in that domain; further differences depend on the research object and its purpose and use. This makes improving Data Quality quite a broad topic which might be daunting to start with.

Conclusions:

- Data Quality covers a wide range of different areas/topics, which makes improving data quality challenging for newcomers. Some scientific domains offer guidance by e.g. providing standards, in other cases also the research object and its purpose and use can provide some input in what needs to be addressed or prioritised.
- On Data Life Cycle: Time is a key element in keeping data FAIR and in its preservation. Due to changes over time in communities, technologies and mechanisms, data that is FAIR at the time of deposition might not still be FAIR in the future. This creates a challenge for both researchers and repositories, and needs to be addressed when developing new tools and mechanisms, as all changes will also require to update existing data and research practices.
- Signposting provides a mechanism to simplify the problem of associating data, metadata, and the canonical identifiers during the act of publishing, and better-enables machines to move from one to the other unambiguously even when distributed over the Web. In a Signposting solution, landing pages have an unambiguous function - that is, to be the broker between the various data and metadata elements by “pointing at them” (signposting). Due to its focus on providing the bare minimum necessary to meet the FAIR requirements it is seen as a very accessible strategy for FAIR Digital Objects in the EOSC ecosystem.
- The ideal is transparency of functions, activities, objects, assessments, outcomes and responsibilities in their full life cycle. Understand the ‘as is’, guide the ‘to be’. We do not have infinite experts and money, so we need to assess value, assign risk, and accept reality. But we need to know the reality.
- The results of the FAIR assessment tools differ greatly on the same data input. However, also the

scoring of the tools creates certain reactions. Not everything that is scored can be addressed by researchers, some (in fact, many!) scores are based on practices of the repository. This can lead to frustration by the data publisher as it is not clear what they could do to improve their “FAIRness”.

Wednesday morning:

Discussion highlights:

- The perspective on [FAIR] assessment from the community via the survey¹⁴ led to the discussion about who is the intended “customer” of FAIR Assessment tools. Uptake of these tools by researchers requires a certain level of trust. Also related is the question of who is the target of the results: Is it just for researchers to check data FAIRness, or is it to show others how FAIR data is? FAIRness is not a measurement of data quality, but can be a stimulus to download the data.
- User feedback on Signposting laid bare a deeper discussion on FAIR: there are many services out there, but it is not clear how they might compliment each other. The growing number of services makes it increasingly difficult for users to navigate the diversity. Clear best practices and examples that researchers can directly use in their work would be very helpful, the FAIR Implementation Profiles provide a good start in this. Having the possibility of interaction with humans, like via a help desk, would be of great value to make FAIR services more accessible.

Conclusions:

- Data FAIRness and Data Quality are sometimes unrightfully connected. This places certain risks, as “FAIR data” does not necessarily mean that the data is of good quality. While data FAIRness also concerns primarily metadata, data quality refers to one data entry point, which means that every record has a quality record, and to really know about the quality of (FAIR) data you need to analyse it in depth, which is very costly to do (especially after the data is published). Guidelines for EOSC and domain specific guidelines might make it easier to ensure the quality of data quality while it is created. The creation of common guidelines however is a challenge due to the overwhelming provenance placed. AI might be able to develop a solution by creating a matrix through a learning model with reuse and reproducibility at the centre.
- FAIR & sensitive or restricted [access] data is mostly done on the basis of trust at the moment, as the data itself is not accessible for everyone. There are several standards in the medical field, but they do not go beyond providing guidelines. Improving data quality is therefore a challenge, since as an “outsider” it is not possible to go into the data; on the other hand, FAIR might be easier to achieve, since as long as the metadata is available the data can be tested by FAIR

14. <https://doi.org/10.5281/zenodo.10797765>

assessment tools. This is not a common practice at the moment, but it has been proven that the tools offer a more objective and better test result as personal assessment by the researcher.

- RO-Crate¹⁵ offers great potential, but also needs to become more accessible for its users. There needs to be investment in training for both researchers and repositories for it to be picked up by the EOSC community so that knowledge can be expanded.

Recommendations

- Clarify the differentiation between FAIR data, data quality and value assessment, and incorporate it into different environments and communities to spread awareness and test the new definition.
- Develop and agree on steered (general and specific) recommendations for the EOSC community for increasing data quality
- Develop metadata criteria for transparency levels in FAIR Assessment tools
- Address the need for a human component to make FAIR Assessment to help the researcher with FAIR Assessment tools and advice: helpdesk & dissemination
- Identify a digital object interchanging mechanism like RO-Crate
- Provide a unified strategy for harmonisation with Signposting
- Use AI to develop and support better suggestions for data FAIRification and FAIR metadata: develop learning models for FAIR
- Conduct objective research into added value/impact of FAIR
- Clarify the responsibilities of repositories and how they interact with FAIR metadata and visibility of data
- Developing data quality indicators, establishing a support framework
- Actionable recommendation for Data Quality, ensure Data Quality is addressing AI training and input data

15. <https://www.researchobject.org/ro-crate/>

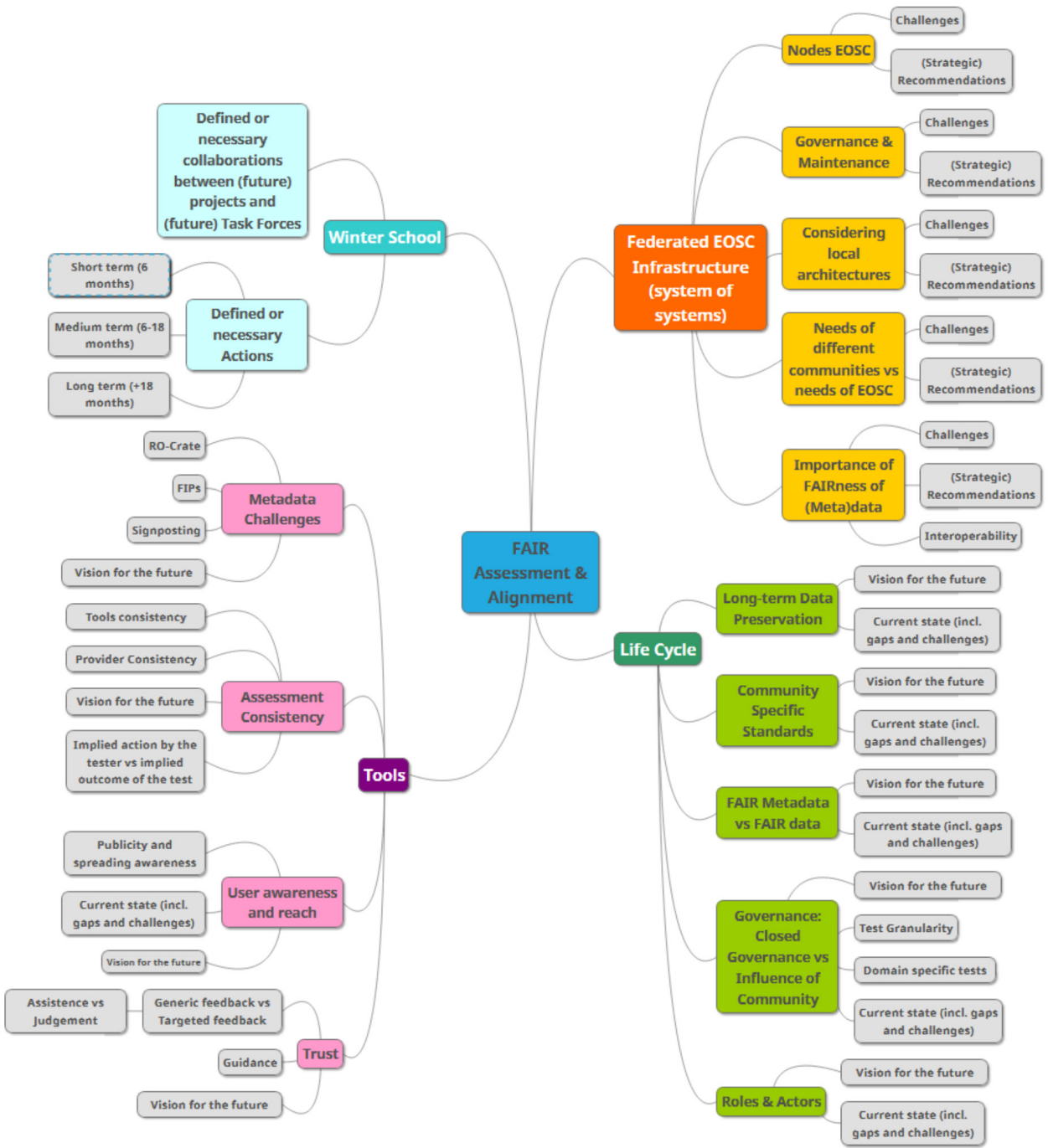


Figure 2: Mindmap for OA¹⁶

16. https://app.mindmup.com/map/_free/2024/01/7c94f720bb7111ee95e1b5efd095ecfb

3.4 / OA4: User & Resource Environments

Tuesday afternoon:

Presentations and discussions from participating TF / RI (OSCARS) / EOSC partners (RAISE, AI4EOSC, EuroScienceGateway, FAIR-EASE, AqualNFRA)

Discussion highlights: common challenges

- VRE is a not well defined term
- Who should get access to VREs
- Access control vs. democratising resources
- Security aspects (abuse of resources vs. exploratory research)

Wednesday morning:

- **EGI services**, building blocks for VRE, esp. Infrastructure Manager (IM) in action by AI4EOSC demo with TOSCA
- **Galaxy interactive tools** (e.g. JupyterNB, Desktop QGIS) for earth-systems (FAIR-EASE demo)
- **Discussion highlights: integration of EGI resources and Galaxy tools**
- How does the IM works, who can use it
- Metadata description of tools and services enable automatic Galaxy integration
- How does Galaxy deal with containers (CernVM-FS, Docker, Singularity, Podman ...)

Wednesday afternoon:

Hands-on exercise: research data lifecycle

- How does Galaxy work a deep dive > AqualNFRA demo
- How does a USER get object storage (MinIO S3) provided by EGI IM into Galaxy
- FAIR workflows scheduled to Italy via distributed compute (Pulsar Network)

Conclusions:

- Distributed compute is possible for every user
- Data integration is seamless on a user level
- User experience is essential for VREs

Recommendations

- Increase user communities e.g. 100.000 users on Galaxy
- Make use of more fancy AAI features (multi-factor, vetting ...)
- Better integration of data discovery across EOSC projects
- More hardware resources and [ensure] their sustainability
- Evolution from VREs to trusted VREs

3.5 / OA5: Skills, Training, Rewards, Recognition & Upscaling

The OA5 group consists of representatives from EOSC projects, EOSC Task Forces and beyond. Together, it has a good overview about and insight into what has been done, what is currently happening, what is planned and what is needed for EOSC skills & training.

The objectives of the OA5 working sessions were:

- To integrate and emphasize Skills, Training, Rewards, Recognition, and Upscaling within the EOSC framework.
- To highlight the importance of Research Assessment in the context of EOSC.
- To align and integrate past, present, and future activities for comprehensive community engagement.

And the expected outcomes were:

- Enhanced integration and understanding of these elements in EOSC projects, aligning with EOSC's diverse short-term, medium-term, and long-term objectives.
- Development of enhanced strategies for community engagement and collaboration in EOSC, focusing on skill development and learning from shared experiences.

On the first day we started with stock taking and mapped the training/skills related activities in past/present/future that we were/are all involved in and aware of. All activities were clustered and the following themes emerged:

- Training material, Learning Paths, Curriculum
- Training Catalogue
- Training Infrastructure
- Competence Centers
- Engagement
- Accreditation/Recognition/Assessment
- EOSC Training & Skills Strategy

For each of the topics we discussed:

- What do we have now/ What is the status?
- What are the issues/challenges?
- What are the next steps needed/wanted (& who should take them)
- Short term, midterm, longterm
- Which EOSC actor(s) should engage with this next steps

Recommendations / Next steps

The recommendations for next steps for the themes/topics identified and discussed can be found in the corresponding table in section 2.1, as well as in the OA5 summary slide deck¹⁷.

The OA5 group intends to stay together as expert group and start moving on the identified actions. The first steps are to organise a follow-up meeting to further define and consolidate the action points of the OA5 discussions during the Winter School, and to liaise with relevant EOSC stakeholders for specific action points. The OA5 group is open for additional contributors.

17. https://eosc.eu/wp-content/uploads/2024/03/20240201_EOSC_WS_OA5_outcomes.pdf

3.6 / OA6: Open Scholarly Communication (OSC)

Tuesday afternoon:

Presentation of projects related to interoperability in OSC, with the following key points:

- Using the same standards is not sufficient to be interoperable.
- Interoperability can be automated, but this would require some level of curation.
- Real-life use cases have to be used to showcase the importance of interoperability in OSC.
- Human resources are still a challenge (to enable interoperability).

Wednesday morning:

- Identification of areas that require action, and formulation of potential recommendations for future of OSC-related initiatives.
- Support the proposal of a Task Force on Open Scholarly Communication.
- Who is responsible for parsing the metadata? Regardless of the answer, parsing of metadata needs to be machine actionable, and include some quality assurance mechanisms for the data it contains.
- AI opportunities and risks are to be explored (i.e. use of LLMs and knowledge graphs), in coordination with other groups.

Best practices in data citation linking data with publications:

- Advocacy to researchers and publishers to improve linking to datasets in publications; useful benefit in return could be to increase the credit of authors who are cited for their datasets.
- Would stronger policies and mandates help, hurt, or be required? What other incentives are there that could be used?
- OpenAIRE & ScholeXplorer¹⁸ provide links between research outputs. Although through enrichment by inference this information can be extracted, in some cases it is necessary to add the links in the papers and metadata of the data sources.

Wednesday afternoon:

- The DIAMAS and CRAFT-OA projects, and the role of Diamond OA¹⁹ in EOSC.
- A structure is proposed to federate the fragmented landscape, allowing resources to be used and shared more effectively.
- Based on the deliverables of DIAMAS and CRAFT-OA projects.

18. <https://scholexplorer.openaire.eu/#/>

19. <https://www.coalition-s.org/diamond-open-access/>

- The goal is to provide a network of services to the community, with a four-tier architecture consisting of:
 - community (journals and scientific communities around journals),
 - national/local/disciplinary capacity centres,
 - regional capacity hubs, and a global “Diamond federation”.
- Can EOSC act as a thematic Capacity Hub?

Recommendations

- The SRIA should make explicit mention to [Open] Scholarly Communication.
- Support the proposal of a Task Force on Open Scholarly Communication to work on concrete actions that cannot be solved by a single project, and further define and understand the:
 - Role of machine actionability of digital objects in OSC. Ways to aid the peer review and quality assessment of the data.
 - Diversity of OSC “outputs” and improve how they are to be treated as “publications”
 - AI opportunities and risks
 - EOSC support to Diamond OA

3.7 / HE Impact: Sustainable Pathways to Impact

Tuesday afternoon:

Sustainability planning & Impact assessment framed in the context of: EU HE project & EOSC partnership performance monitoring requirements and impact assessment framework.

- Sustainability modelling in Research Infrastructures
- TF-FinSust recommendations for a sustainable EOSC

Discussion highlights:

- EOSC Partnership and EU Projects have similar reporting requirements and sustainability concerns
- Impact assessment is a relevant dimension in the EC monitoring framework

- We all need to contribute to measure impact
- Complex task but methodologies exist/being prepared (EC, OECD, PathOS..)
- Previous experiences in Research Infrastructure sustainability modelling can inform sustainability planning

Wednesday morning:

- Framing the scope of work for the interactive sessions
- Presenting the importance of Intellectual Property Rights in the context of future sustainability and exploitation based on an example of a complex project
- Presentations on KERs by the projects' representatives!

Wednesday afternoon:

- Introduction/testing of Sustainable Exploitation Pathway (SEP) methodology by Ilaria Nardello and Aneta Pazik-Aybar): -> project support in expressing their sustainability plan in a more standardised way
- Hands-on experience of the SEP application, workgroups
- Feedback:
 - Useful addition to the toolkit - it forces people to think through key aspects of sustainability
 - Some modifications to the template proposed
 - More opportunity for discussion in future winter schools would be valued
 - Value in exchange of views and vantage points
 - Support in the evaluation of sustainability plans would be appreciated
 - EOOSC Forum will be utilised to discuss and further test the SEP methodology
 - The uncertainty around the future governance of EOOSC, onboarding procedures and use model, make it difficult for projects (and any stakeholder) to model the exploitation of their products through the integration of their KERs into EOOSC.

4. The road to Thessaloniki

The first edition of the EOSC Winter School was conceived after a suggestion by the European Commission (EC) at the yearly coordination meeting with the INFRAEOSC projects in June 2023 in Brussels (Figure 3). On this occasion, both the EC and the projects identified a significant lack of collaboration between the Horizon Europe (HE) EOSC-related projects that put the progress towards creating a working EOSC at risk. This prompted the EOSC Association (EOSC-A), in cooperation with the EOSC Focus project, to start exploring the possibility of organising a face to face event to increase the collaboration opportunities between EOSC-related projects, embedded in the collaboration framework of the “Vademecum”²⁰.

Evolution of INFRAEOSC Projects Collaboration

May 2023 – February 2024

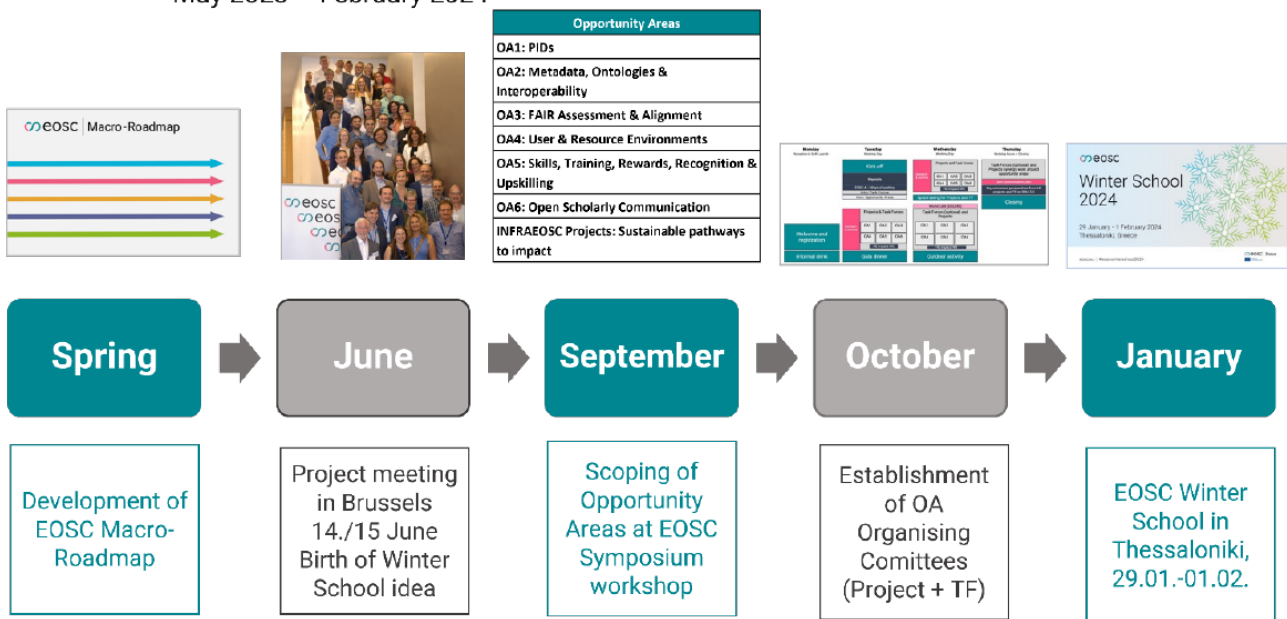


Figure 3: Evolution of INFRAEOSC projects collaboration: overview of activities within the collaboration framework with HE EOSC-related projects (Credits Ute Gunsenheimer)

20. Vademecum: A Handbook for Effective Collaboration within the EOSC Co-Programmed Partnership, <https://bit.ly/EOSCVademecum22>.

The Vademecum provides a rationale and practical measures to increase the alignment among INFRAEOSC projects, and between these and EOSC-A, that is fully compatible with the legal setting of the respective Grant Agreements under which the projects work. Its implementation is expected to contribute significantly to advance in the implementation of EOSC.

Under the leadership of EOSC-A, and in cooperation with EOSC Focus, the Vademecum has already generated its first results:

- Three “Horizon Europe Working Groups” (HE WGs) to enhance the cooperation among EOSC-related projects across three areas: Technology, Communication and Engagement, and Impact. These correspond to areas C, D and E of the Vademecum (Figure 4).
- The interviews carried out with the (then) 18 Horizon Europe EOSC-related projects with the goal of creating a visual map of the progress in the development of EOSC—the Macro-roadmap for the implementation of EOSC²¹.

The detailed description of the activities and expected Key Exploitable Results of the projects obtained from the interviews have provided further input to the discussions of the Horizon Europe Technology Working Group (HE Technology WG), and helped define the six “Opportunity Areas for technical collaboration” as the topics of common interest among HE EOSC-related projects with higher chances to result in collaborations with concrete outcomes. The OAs represent a “down-to-earth” mapping of the more high-level Action Areas defined in EOSC’s Strategic Research and Innovation Agenda (SRIA)²² into actionable topics. The seventh track, “Sustainable pathways to impact”, was not discussed at the HE Technology WG meetings, but it was added to the programme of the WS because of its relevance for all projects.

The members of the HE Technology WG realised that in order to achieve significant advances in the topics of the OAs, it would be good to organise an event where these topics could be properly discussed beyond the monthly WG meetings. Building on the synergies between projects that come out of the interviews, it seemed plausible to establish collaborations between projects on topics of common interest, expanding the examples of this that had already happened in the WG.

As a result of the work in the WG, EOSC-A and the HE Technology WG decided in September 2023 to organise the EOSC Winter School in late January 2024. First preparations on the content were done during the 2023 EOSC Symposium in Madrid; later partners from the RAISE project consortium from the Aristotle University of Thessaloniki volunteered as local organising team. Once the place and the time for the WS were decided, work on the detailed programme and invitation list done were started by EOSC-A and EOSC Focus.

21. <http://eosc.eu/roadmap>

22. See the latest version of SRIA in <http://eosc.eu/sria-mar>. The action areas are defined under “Implementation challenges” on chapter 5 (page 86) in version 1.2 (November 2023).

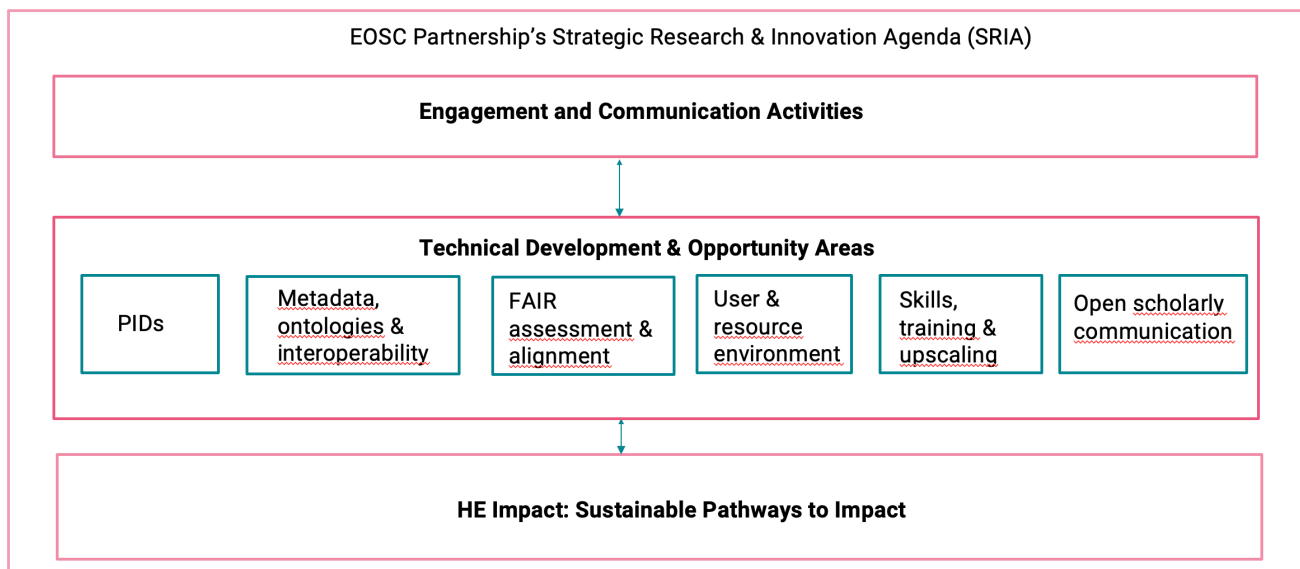


Figure 4: Overview of the collaboration framework with HE EOSC-related projects (HE / Vademecum Groups)

4.1 / Objectives of the WS

The WS had two overall goals: to enhance the collaboration between HE EOSC-related projects by enabling in-depth discussion on the OAs, and to integrate the deliverables of the EOSC-A Task Forces into the projects to ensure continuity and application of the Task Forces' work. The goals were split into short-, medium-, and long-term objectives:

Short-term objectives

- Hand over results of EOSC-A TFs to the HE EOSC-related projects.
- Establish structured collaborations between the new EOSC-A TFs and the projects.
- Hands-on discussion on the OAs to establish closer technical collaboration between projects.

Mid-term objectives

- To frame inter-project collaboration that allows seamless onboarding of future projects
- Contribute to shaping the vision of SRIA 2.0

Long-term objectives

- Increase the potential of the HE EOSC-related projects to deliver sustainable results that benefit the EOSC deployment and thereby maximise project impact
- The significance of this event is underscored by its potential to bring together a diverse range of perspectives, offering a rich blend of insights and experiences.

The activities during the WS were designed to ensure the participants were aware of this plan and engaged in an optimal way to achieve the goals set, in order to have a lasting and meaningful impact on the EOSC deployment and its related projects.

4.2 / Organisation

4.2.1 Programme committee and OA subcommittees

The organisation of the WS programme was a joint effort of EOSC Focus, the HE Technology WG, and EOSC-A. The programme committee was formed by Ute Gunsenheimer (chair, EOSC-A), Ilire Hasani-Mavriqi and Marthe Bierens (TU Graz), and Edith Euan and Teodor Ivanoica (EOSC-A). To specify the content of each of the "tracks" to be followed during the WS, one "sub-committee" was established for each OA, each one formed by

- two representatives from HE EOSC-related projects working on the topic
- the co-chairs of the EOSC-A TFs directly related to the topic
- (at least) one representative of EOSC-A Board of Directors
- one staff to provide logistical support.

This structure allowed each sub-committee to develop the programme independently, defining the goals of each track and choosing the activities accordingly. The full composition of the subcommittees can be found in the Appendix.

A dedicated page under EOSC-A's website²³ was published to inform participants of all relevant details, as well as to allow the larger EOSC-A community a glimpse on the preparations for the WS. The website contained a separate tab for each OA in which specific instructions, a reading list of relevant documents, and the specific objectives to be reached by the end of the sessions could be found, prepared by the respective sub-committees.

23. <https://eosc.eu/eosc-focus-project/winter-school-2024/>

The invitation to participate in the WS was extended to all relevant stakeholders in the development of EOSC, including:

- All Horizon Europe INFRAEOSC projects granted between 2021 and 2023;
- EOSC-A TF co-chairs, of which 18 attended;
- Members of EOSC-A Board of Directors;
- Representatives from the EC (DG RTD and DG CNECT).

The number of attendees per project was not uniform and depended, among other factors, on the involvement of project members in EOSC-A TFs. This resulted in a total of 118 participants.

4.2.2 Local organisers

The Laboratory of Medical Physics of the Aristotle University of Thessaloniki, coordinator of the RAISE project²⁴, provided the local support to organise the WS. The venue chosen was the hotel Mediterranean Palace close to the city centre.

24. <https://raise-science.eu/>

5. Programme of the WS (overview)

After a welcome reception on the evening of Monday 29 January, the WS kicked-off on Tuesday 30 January with a plenary session at the Aristotle University of Thessaloniki; the WS proper began in the afternoon. The meetings and discussions took place in three sessions between Tuesday afternoon and Wednesday 31 January, with a gala dinner held on Tuesday evening. The results and conclusions of all OAs were presented in a joint session on Thursday 1 February.

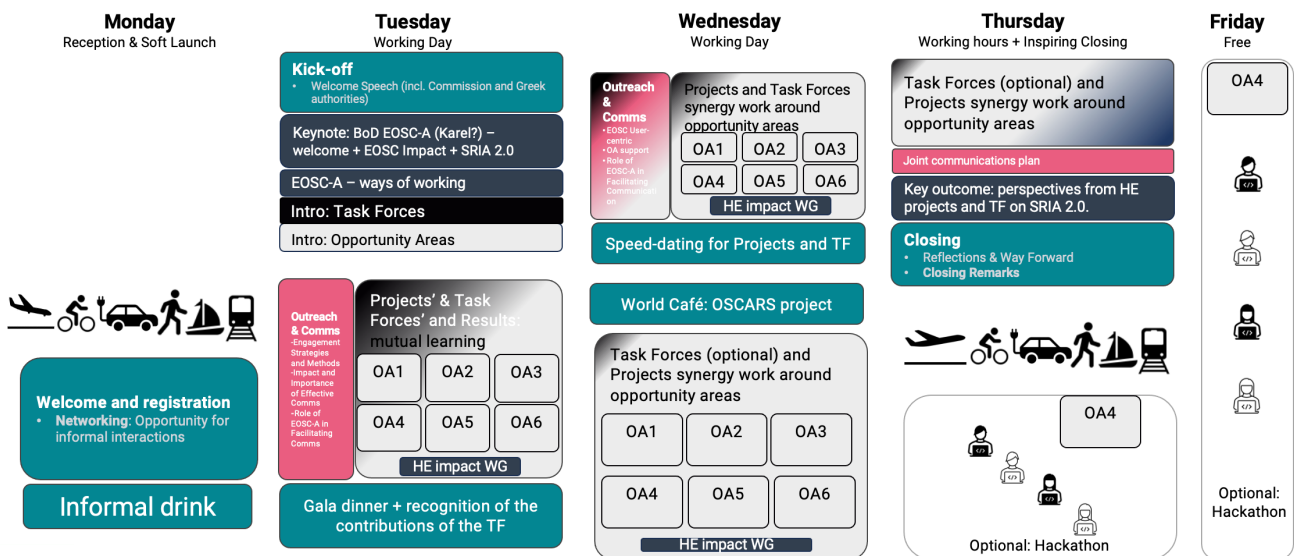


Figure 5: Programme of EOOSC Winter School 2024

The figure above provides an overview of the structure of the WS programme; for full details please refer to the WS website.

6. Plenary session

The plenary session on Tuesday morning brought all participants on the same page about the place of the WS in EOSC's timeline. The session was opened by EOSC-A secretary general Ute Gunsenheimer, followed by the local hosts Evdokimos Konstantinidis and Panagiotis Bamidis from the Medical Physics and Digital Innovation Lab at the Aristotle University of Thessaloniki, as well as representatives from Thessaloniki's town hall and Macedonia and Thrace regional governments), and representatives from EC (both DG RTD and DG CNECT), EOSC-A, and the OSCARS project. The main messages conveyed in these presentations were as follows:

- The EC started and has led the development of EOSC and the necessary policies, and it is taking the necessary steps to make EOSC become a reality.
- The EOSC EU Node is the EC's initiative to start EOSC as a "federation of nodes". The EU Node will be funded for three years by the consortia winners of the public procurement tender²⁵. Other "EOSC nodes" are to be organised by the EU Member States or Associated Countries on a national or regional basis, or else follow a thematic approach.
- Data needs to be made as FAIR as possible before it is made open.
- EOSC-A has channelled the voice of the community via its Task Forces. After two years, the TFs have completed their mandate, and it is now up to the community—represented by the project consortia—to adopt the results and knowledge obtained.
- The EOSC WS has been chosen as the best format to enable INFRAEOSC projects and TFs to explore collaboration opportunities in specific technical topics derived from the SRIA.
- The OSCARS project²⁶ will build on the results of the science cluster projects²⁷ to ensure the continuation of their results and their uptake by scientific communities.

25. <https://ted.europa.eu/en/notice/-/detail/712679-2023>

26. <https://eosc.eu/eu-project/oscars/>

27. <https://science-clusters.eu/>

7. Lessons learnt from the first EOSC Winter School and conclusion

The organisation of the first EOSC Winter School as a first attempt with this format yielded satisfactory results indicating progress in the desired direction. It is important to assemble a diverse group comprising members from various EOSC-related projects, EOSC-A Task Forces (TFs), EOSC-A Board of Directors (BoD), European Commission (EC), and other stakeholders to ensure comprehensive perspectives are brought to the table during discussions.

Facilitating the Opportunity Areas, including the HE Impact Group, e.g., with report templates, is essential for capturing results and proper documentation. Additional input from the HE Technology Group, Opportunity Areas and EOSC-A Task Force co-chairs is necessary to translate the outcomes into a work plan. The HE Technology WG has effectively initiated discussions with EOSC-related projects regarding collaborative opportunities. While this shows potential for shaping the development of a unified EOSC, it remains in an early stage of maturity. The HE Impact WG on EOSC Forum has grown from 25 to 48 members after the WinterSchool; a continuous engagement plan is being prepared through EOSC Focus WP4.

An emerging work plan for collaboration among HE EOSC-related projects is underway, albeit requiring further refinement for solid establishment. It is advisable to repeat the Winter School with appropriate adjustments to goals, format, and methodology.

The Coordination Meeting with the EC in mid/end-June 2024 and the 2024 EOSC Symposium in October serve as opportune moments to evaluate the success of the collaborations initiated.

The HE Technology Group remains the primary platform for all EOSC-related projects to participate, ensuring alignment on the facing EOSC's key technical challenges.

8. References














No	Description / Link
R1	Strategic Research and Innovation Agenda (SRIA) of the European Open Science Cloud (EOSC), Version 1.0 https://eosc.eu/wp-content/uploads/2023/08/SRIA-1.0.pdf
R2	MoU for the Co-programmed European Partnership on the European Open Science Cloud: https://eosc.eu/sites/default/files/20210215_EOSC_MoU_FinalDraft.pdf
R3	Strategic Research and Innovation Agenda (SRIA) of the European Open Science Cloud (EOSC), Version 1.1 https://eosc.eu/wp-content/uploads/2023/08/SRIA-1.1-final.pdf
R4	The Strategic Research & Innovation Agenda (SRIA) and its Multi-Annual Roadmap (MAR) https://eosc.eu/sria-mar
R5	Horizon Europe Work Programme 2021-2022. https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-3-research-infrastructures_horizon-2021-2022_en.pdf
R6	Vademecum – A handbook for effective collaboration within the EOSC co-programmed Partnership https://bit.ly/EOSCvademecum22
R7	HE Technology Forum page (The content is only visible to group members) https://forum.eosc.eu/group/he-technology/timeline
R8	News Article - Coordination meeting for EOSC-related Horizon Europe projects https://eosc.eu/news/coordination-meeting-eosc-related-horizon-europe-projects
R9	News Article - Breadth of EOSC Partnership on full display at HE projects coordination meeting https://eosc.eu/news/breadth-eosc-partnership-full-display-he-projects-coordination-meeting
R10	HE INFRAEOSC: Enabling an operational, open and FAIR EOSC ecosystem https://bit.ly/3PLei6q
R11	The Macro-Roadmap for the implementation of EOSC is a visual mapping of the results of EU projects developing EOSC and the in-kind contributions of EOSC Association member organisations. https://eosc.eu/roadmap
R12	EOSC-A Task Forces. https://eosc.eu/eosc-task-forces














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Appendix

List of participating projects

Project logo	Coordinator / Technical coord.	Organisation	Website
	Eliane Westwick?	ELIXIR	https://by-covid.org/
	Fotis Karayannis	Innov-acts	https://e-irg.eu/e-irgsp7/
	Fotis Karayannis (coord.), Panagiota Koltsida (tech.)	ATHENA - Research & Innovation	https://www.esfri.eu/str-esfri
	Ute Gunsenheimer (coord.), Teodor Ivanoaica (tech.)	EOSC Association	https://eosc.eu/eosc-focus-project
	Tomi Suominen (coord.), Mark van de Sanden (tech.)	CSC	https://faircore4eosc.eu/
	Björn Grüning (coord.), Anika Erxleben-Eggenhofer	University of Freiburg	https://galaxyproject.org/projects/esg/
	Salvador Capella (coord.)	Barcelona Supercomputing Center (BSC)	https://eosc4cancer.eu/
	Álvaro López García (coord.), Amanda Calatrava (tech.)	Spanish National Research Council (CSIC)	https://ai4eosc.eu/
	Emma Lazzeri (coord.)	Consortium GARR	https://www.skills4eosc.eu/about
	Alessandro Rizzo	National Centre for Scientific Research (CNRS)	https://fairease.eu/about
	Simon Hodson (coord.)	CODATA	https://worldfair-project.eu/the-project/
	Evdokimos Kostantinidis	Aristotle University Thessaloniki	https://raise-science.eu/
	Margo Bargheer (coord.), Sy Holsinger (tech.)	Georg-August-Universität Göttingen Stiftung Öffentlichen Rechts	https://www.craft-oa.eu/

Project logo	Coordinator / Technical coord.	Organisation	Website
	Thanasis Vergouils, Clifford Tatum	ATHENA Research & Innovation	https://graspos.eu/
	Ari Asmi (coord.)	RDA	https://by-covid.org/
	Thanasis Vergouils	ATHENA - Research & Innovation	https://e-irg.eu/e-irgsp7/
	Henning Sten Hansen (coord.), Arne Berre (tech.)	Aalborg University	https://www.esfri.eu/str-esfri
	Sara Pittonet (coord.), Dick Schaap (tech.)	CNR	https://eosoc.eu/eosoc-focus-project
	Ingrid Dillo (coord.)	DANS	https://faircore4eosoc.eu/
	?	Spanish National Research Council (CSIC)	https://galaxyproject.org/projects/esg/
	Giovanni Lamanna (coord.)	National Centre for Scientific Research (CNRS)	https://eosoc4cancer.eu/
	Fotis Psomopoulos	CERTH	https://ai4eosoc.eu/
	Natalia Manola (coord.), Tomasz Miksa (tech.)	OpenAIRE	https://www.skills4eosoc.eu/about
	?	Universidad de Murcia	https://fairease.eu/about
	?	EMBL	https://worldfair-project.eu/the-project/
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List of participants per Opportunity Area

OA1: PIDs		
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Nick Juty	University of Manchester	FAIR-Impact
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Esteban Gonzalez	Universidad Politécnica de Madrid	FAIR-IMPACT
Arofan Gregory	Observatoire de Paris-PSL	WorldFAIR & FAIR-IMPACT
Simon Hodson	CODATA	WorldFAIR, FAIR Impact, RDA Tiger, Semantic Interoperability TF
Teodor Ivanoaica	EOSC Association	EOSC Focus
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Alexandra Kokkinaki	National Oceanography Centre (Greece)	Blue-Cloud 2026, FAIR-EASE
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OA3: FAIR Assessment & Alignment		
Name	Organisation	Projects & TFs
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Andrea Bertino	Switch	TF FAIR Metrics & Data Quality
Marthe Bierens	TU Graz	EOSC Focus
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OA4: User & Resource Environments		
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Jana Broncova	Masaryk University	AAI Architecture
Ignacio Blanquer	Universitat Politècnica de València	EOSC-A
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Catalin Condurache	EGI Foundation	EOSC Future
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Merret Buurman	IGB	AqualNFRA
Kaori Otsu	CREAF	EOSC Focus / AqualNFRA
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OA5: Skills, Training, Rewards, Recognition and Upscaling		
Name	Organisation	Projects & TFs
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Helen Clare	Jisc	TF Upskilling Countries / EOOSC Future / EOOSC Synergy
Romain David	ERINHA	EOOSC-Life / BY-COVID / ISIDORe / OSCARS
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Celia van Gelder	Health-RI/ELIXIR-NL	TF Data Stewardship Curricula and Career Paths / EOOSC-Life / EOOSC4Cancer
Sara Di Giorgio		Skills4EOOSC
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OA6: Open Scholarly Communication		
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Pierre Mounier	AMU	DIAMAS
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Tomasz Miksa	TU Wien	OSTrails
Stefania Amodeo	OpenAIRE	SciLake
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Franciska de Jong	CLARIN-ERIC	EOSC Focus
Alessandro	CNRS	FAIR-EASE
Vasso Kalaitzi	DANS	FAIR-IMPACT
Karel Luyben	EOSC-A	-
Jan Meijer	Sikt	EOSC Future, TF FinSust
Ilaria Nardello	EOSC-A	EOSC Focus
Aneta Pazik-Aybar	NCN	EOSC Focus
John Picard	CLARIN-ERIC	EOSC Focus
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Christos Arvanitidis	LifeWatch ERIC	EOSC Future
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Apostolas	ViLabs	RAISE
Marieke Willems	ELIXIR	BY-COVID
Katrin Winkler	EC DG RTD	

Reading lists for participants

OA1: PIDs: <https://eosc.eu/oa1-pids-persistent-identifiers/>

OA2: Metadata, Ontologies and Interoperability:
<https://eosc.eu/oa2-metadata-ontologies-interoperability/>

OA3: FAIR Assessment & Alignment: <https://eosc.eu/oa3-fair-assessment-alignment/>

OA4: User & Resource Environments: <https://eosc.eu/oa4-user-resource-environments/>

OA5: Skills, training, rewards, recognition & upscaling:
<https://eosc.eu/oa5-skills-training-rewards-recognition-upscaling/>

OA6: Open Scholarly Communication: <https://eosc.eu/oa6-open-scholarly-communication/>
INFRAEOSC Projects: Sustainable Pathways to Impact: <https://eosc.eu/eosc-focus-project/winter-school-2024/infraeosc-projects-sustainable-pathways-to-exploitation-of-key-results/>

Report on the EOSC Winter School 2024

eosc.eu/eosc-focus-project/winter-school-2024

